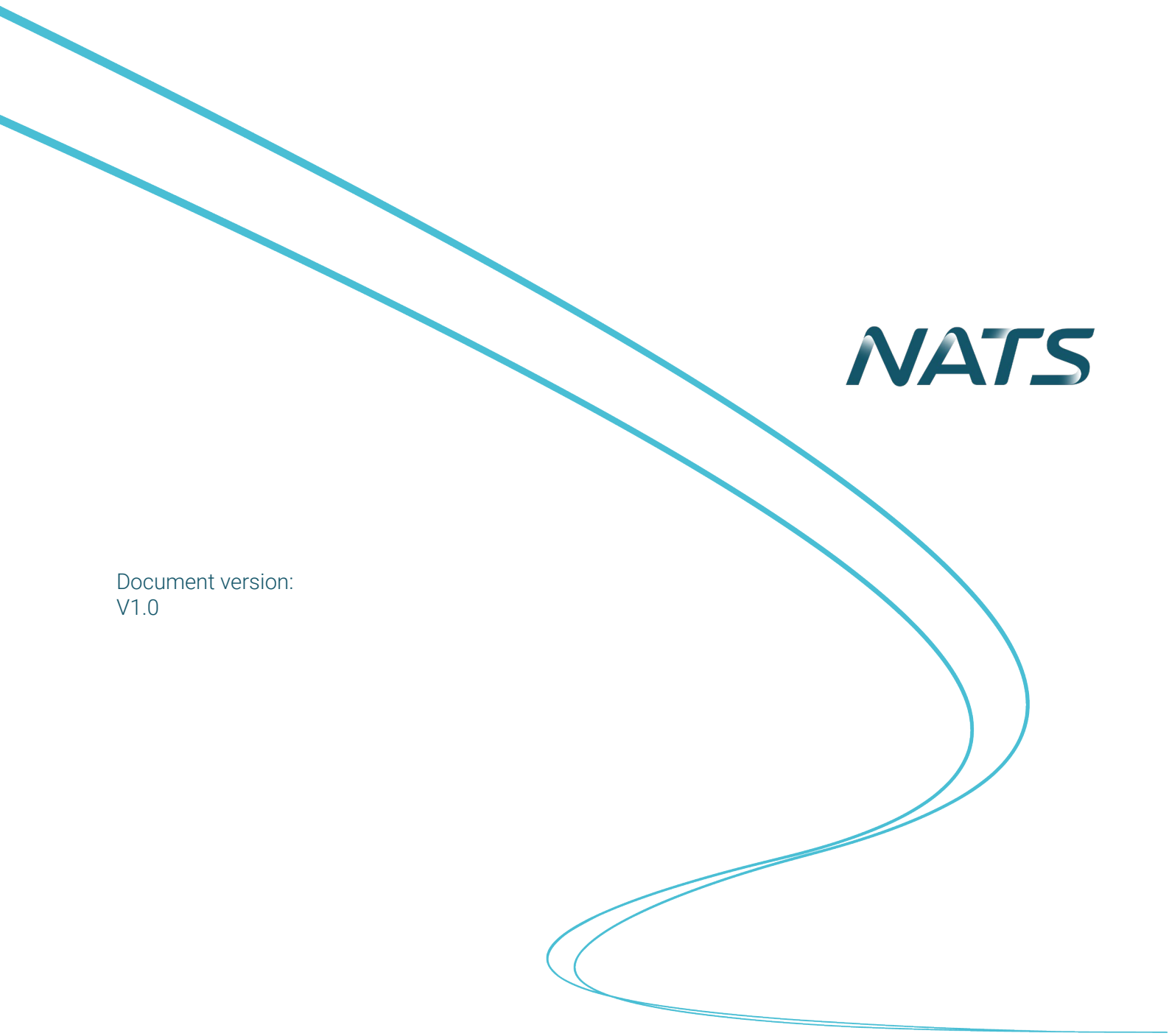
BVLOS Trial in Unsegregated Airspace

Remotely Piloted Drone Flight Trial Documentation:
Airspace Change Proposal
ACP-2024-001



NATS

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V1.0

Contents:

Change History

Issue	Month/Year	Changes this issue (most recent first)
V1.0	December 2024	Published on CAA airspace change portal (redacted version). Unredacted version submitted directly to CAA.

1. Introduction

1.1.1 The sponsor of this trial airspace change is NATS Services Ltd (NSL), the commercial arm of NATS. Our reference is ACP-2024-001 and this is the link to the CAA's airspace change portal, where all published material on this trial resides.

1.1.2 This document is the formal application from NSL to the CAA for the creation of a Temporary Reserved Area (TRA). It contains appropriate supporting evidence of potential impacts, and stakeholder engagement on that evidence. There are eleven annexes listed in Section 12 on p.26.

2. Description of the Proposal and Impacts

2.1 Drivers for change

2.1.1 NSL intends to create a TRA over parts of the North Sea. Its purpose is to further the understanding of how uncrewed aircraft (UA) could be safely integrated with crewed aircraft in a shared airspace environment.

2.1.2 Historically, most Beyond Visual Line Of Sight (BVLOS) flights occur in disruptive Temporary Danger Areas (TDAs). This segregates not only the UA from all other air traffic, but it also prevents other traffic routinely flying inside, thus reducing airspace availability. Our trial would establish a TRA, or Temporary Reserved Area, within which any cooperative aircraft could fly, subject to some simple rules.

2.1.3 This trial aligns with the UK's Airspace Modernisation Strategy (AMS, also known as CAP1711), one aim of which is to integrate BVLOS UA in the UK's airspace.

2.1.4 This trial also recognises the work of the CAA in developing policy to support and deliver the AMS, in this case their document CAP2533 which presents an airspace policy concept for the transition of BVLOS flight from segregated, to accommodated, to integrated. This trial recognises CAP2533 and is part of the CAA's "Sandbox" CAP2616 which supports the accommodation phase of this policy concept document.

2.2 Our partner unmanned aircraft operator

2.2.1 We have partnered with the UA operator Flylogix to conduct an integrated airspace flight trial over the North Sea. Flylogix is a well-established professional organisation operating BVLOS flights in the North Sea for over six years working closely and routinely with other North Sea airspace users. Here, we build on the CAA's "Sandbox" for BVLOS innovation under controlled conditions.

2.2.2 Flylogix has undertaken numerous routine BVLOS operations in TDAs, approved by the CAA. Examples are ACP-2024-005 (link), and ACP-2023-083 (link), and the document CAP2261 (link) summarises Flylogix' CAA Sandbox participation from 2021.

2.2.3 Other UA operators may also be accommodated as long as they have appropriate Operational Authorisation (OA, via an Operational Safety Case (OSC)), plan to undertake a suitable type of operation, comply with the ruleset of the proposed trial airspace, and are subject to agreement of service provision.

2.3 Statement of Need

2.3.1 A Statement of Need (SoN) is the official submission requesting an airspace change, in this case for a trial. Ours reads:

What is the objective of the proposed change?

The proposed Airspace Trial, led by NATS Services Ltd (NSL) will demonstrate the end-to-end scalable solution and innovative technology to enable the safe accommodation / integration of uncrewed and crewed operations. Our aim is to develop a safe and scalable solution, in the North Sea that enables strategic deconfliction, flight authorization, managed access to the trial airspace and utilising enhanced situational awareness. Through the provision of a cooperative layered system underpinned by ANSP support, NSL will provide data and evidence to progress the CAA's policy on safe integrated operations and in doing so support wider replication elsewhere.

NSL have partnered with an OSC[1] approved BVLOS operator and begun engagement with key stakeholders to demonstrate a safe and effective solution to integrate crewed and uncrewed aircraft into a trial airspace located at the North Sea. Whilst providing the benefits of an environmentally friendly service in respect of significantly reduced carbon emissions, the concept will directly support the development of operations that are eventually agnostic to the land or maritime environment.

Please provide a summary of the issue or opportunity this proposal is seeking to address including any safety, operational, technical, environmental or economic factors.

The development of the UK BVLOS ecosystem from an individual flight posture to industrialisation is dependent on a safe and effective regulatory infrastructure. Scaling the BVLOS industry from concept to realisation requires the safe integration of crewed and uncrewed air vehicles in an unsegregated airspace environment, aligning with the CAA's 2040 Airspace Modernisation Strategy (AMS). NSL believe this proposed airspace trial will strongly support and accelerate those aims.

In addition to many North Sea use cases, the oil and gas industry relies on conventional helicopters for surveying climate impacts to meet the UK's Net Zero goals by 2050. However, this method is costly in terms of both emissions and finances. Uncrewed operations provide an efficient environmental and fiscal cost reducing mechanism while enhancing responsiveness, flexibility, and availability. This shift to uncrewed aligns with the UK's broader strategy to decarbonise the economy and supports the industry's commitment to achieve the 2030 target of reducing man-made methane emissions by 30%. Uncrewed air systems provide a solution that not only reduces costs and emissions but also further mitigates the risk to life associated with conventional, crewed airborne support activities.

NSL is committed to leading and accelerating changes required for a safe, scalable, unsegregated airspace solution, and we look forward to sharing the insight and knowledge gained from our trials with the CAA. In doing so supporting the UK Government aim for leading the development of Future Flight, the CAA 2040 AMS, and ultimately helping deliver the required strategic outcome of safe integration of new airspace users.

Please provide a description of the current airspace design (i.e. the airspace structure and flight procedures) relevant to this proposal.

The proposed trial airspace falls within Class G, over water, and inside this airspace, helicopter operations are primarily conducted to support the oil and gas industry. This area is supported via ATS / FIS services by Aberdeen ANSP under licence (an NSL unit).

[1] Operational Safety Case

Historically and planned BVLOS operations have been (are planned to be) conducted in this region via use of TDAs.

Please provide a description of the current prevailing air traffic situation (i.e. frequency and number of movements) and an indication of estimated forecast growth (where applicable).

Given the North Sea location there is relatively little GA traffic at present. The predominant operation in this area is essential commercial traffic for the North Sea Oil and Gas industry, primarily facilitated through helicopter support and typically operating around 2000-3000 feet, around 145 operations occurring per weekday.

Given the licenced North Sea operation – the traffic environment is well understood. It should be noted that the current crewed movements are situated above the typical height of intended BVLOS operations. As part of our planned activity, we will be able to provide a much more data driven specification of typical traffic.

Additional information

NSL are actively involved in supporting numerous future flight initiatives and commercial projects as well as delivering uncrewed air vehicle management and approvals at airport units where we provide ATS. We see this proposed airspace trial activity as the most significant step for us in supporting the AMS and BVLOS policy evolution and being the culmination of years of our research & learning. For this airspace trial - we have a mature project with existing investment confirmed, reflecting our high level of focus, and demonstrating our strong commitment to leading new airspace user enablement; we wish to advance in this project as swiftly as possible.

2.4 Aims of the proposal

The high level objectives of this proposal are:

2.4.1 Safely integrate uncrewed BVLOS traffic with crewed traffic

The airspace trial is to demonstrate the safe integration of uncrewed BVLOS operations in the unsegregated airspace environment.

2.4.2 Develop a solution for Integrated Traffic Management

Develop a solution that facilitates planning, strategic deconfliction and airspace management to support the UA/DAA ecosystem.

2.4.3 Develop situational awareness for airspace users in Class G

The provision of a “recognised air environment” increases the situational awareness of the of cooperative traffic enabling a safer operating environment – development will be explored.

2.4.4 Inform future policy development

The data, information and experience gained in the live environment will inform the CAA in their development of new policies, standards, and procedures to reduce the impact of airspace segregation, with regard to BVLOS, surveillance and Detect And Avoid (DAA).

This is the main justification for the trial, to help find ways to move away from disruptive TDAs into an environment in which both crewed and uncrewed aircraft can safely operate in an integrated manner.

2.4.5 The trial is focused on the establishment of a TRA which is supported by NSL’s safe and scalable solution. This includes an Uncrewed Traffic Management (UTM) software platform, enhanced remote pilot situational awareness via surveillance feed, with people and processes at its heart. Details are commercially confidential and not published in this trial ACP.

2.4.6 In addition to this, Flylogix, will conduct their operations and demonstrate their DAA approach. The trial aims to demonstrate the safe integration of crewed and uncrewed traffic within unsegregated airspace.

Key aspects of the trial include:

2.4.7 Airspace and Strategic Deconfliction

The proposed trial airspace is a TRA with TMZ (Transponder Mandatory Zone).

The Enduring Integrated Traffic Management (E-ITM) solution will trial strategic deconfliction by using submitted flight intent notifications (FINs) by the uncrewed operator. FINs can be approved/rejected/amended based on strategic deconfliction and the workload of Air Traffic Control (ATC).

All these steps will be recorded to clarify the dependencies to support the move towards a scalable solution.

2.4.8 Operational Plan

Flylogix will conduct up to 80 sorties throughout the 6-month trial period, to be split between Whinnyfold and Scatsta take-off and landing points (TOLPs). The typical flying schedule is split into two week blocks, with gaps in between. This would be an average of four flights per week, per site – though some weeks may be more, some weeks fewer. The sorties would be to/from offshore installations, or other maritime operation.

These real-world operations will gather data to validate the approach and the capability of the proposed solution. There is potential to introduce other uncrewed aircraft operators in latter phases to further expand the dataset, enriching the analysis and supporting the progression from “accommodation” to “integration” of uncrewed flights.

2.4.9 Detect And Avoid (DAA) Approach

The uncrewed operator will demonstrate their DAA capability as per their OSC.

Our proposed solution is a multilayered approach starting with strategic deconfliction, which allows the submitted trajectory to be deconflicted with other known trajectories.

According to the proposed electronic conspicuity (EC) ruleset, uncrewed aircraft must operate ADS-B In/Out and Mode-S transponders, while crewed aircraft must operate ADS-B Out and Mode-S. This will enable uncrewed aircraft to detect surrounding traffic through their onboard receivers and be detected by NATS’ ground surveillance systems. By providing NATS’ surveillance feed to enhance the uncrewed operator’s situational awareness, the uncrewed operator's DAA approach will be one of the trial objectives to be analysed.

2.4.10 Stakeholder Feedback Throughout the Trial

We will arrange regular[2] feedback sessions directly with North Sea operators, the MoD and other stakeholders. This will gather opinions on the trial’s progress, and identify potential issues should any arise. We will also provide an email address for questions or complaints from other interested parties.

2.5 High-level trial plan phases

2.5.1 This trial is part of the CAA’s CAP2616 Sandbox scheme, which encourages sponsors to test and trial concepts to support potential future BVLOS operations in unsegregated airspace. This section summarises the main elements of each phase of the trial plan. The detailed trial plan (with highly specific objectives) will be submitted separately as Annex I, part of the ACP but not published due to commercial confidentiality. We will work with the

[2] Period TBC, e.g. monthly or alternate-monthly.

CAA's Sandbox team to refine the detailed trial plan as necessary, which may be after ACP approval subject to a successful outcome.

High-level phases

2.5.2 Phase 1: Single uncrewed BVLOS operation by Flylogix

In this foundational phase, Flylogix, will be accommodated within the TRA for the flight of a single UA at a time. Flylogix will perform either methane sampling or maritime operations.

This phase focuses on demonstrating the proposed solution with minimal uncrewed traffic, validating fundamental capabilities in the trial airspace.

The key objective is to demonstrate operational workflows for accommodating a single UA under the proposed ruleset.

The Phase 1 high-level trial plan includes:

- Flight Intent Notification (FIN) Submission: Submission of FIN for review and approval.
- Strategic Deconfliction: Assessment of potential conflicts and resolution through an approve/reject/amend process.
- Pre-Take-Off Coordination: Communication between uncrewed aircraft operator and Aberdeen ATC, as well as pre-flight checks.
- In-Flight VLOS Phase: Position correlation and identification after take-off.
- In-Flight BVLOS Phase: Consideration of DAA capability.
- Post-Flight Data Analysis: Capturing and study of flight data, including both nominal and non-nominal situations, according to methods to be agreed with the CAA Innovation Team.

2.5.3 Phase 2a: Simultaneous Operations with Two Uncrewed Aircraft by Flylogix

This phase (which is conditional, subject to availability) would introduce two simultaneous BVLOS operations by Flylogix, each managed by a separate crew. Operations would continue to focus on methane sampling or maritime operations.

The Phase 2a high-level trial plan includes:

- Assessing the solution's ability to manage multiple uncrewed aircraft under the same ruleset.
- Evaluating the workload increase for airspace users and Aberdeen ATC.
- Gathering data to validate the scalability of the solution with increased traffic.

This may require an extension from 6 months to 12 months.

2.5.4 Phase 2b: Inclusion of additional BVLOS operator(s)

This phase (which is conditional, subject to availability and trial timing) would introduce additional BVLOS operator(s) with an approved OSC. They would conduct flights under the TRA ruleset alongside Flylogix, increasing the operational complexity and demonstrating interoperability.

The Phase 2b high-level trial plan includes:

- Validating the scalability of the solution with diverse operators and mixed traffic.
- Gathering data on procedural consistency and the ability to integrate additional operators safely.
- Demonstrating the solution's robustness in a more complex environment.

Due to the time it takes to engage additional operator(s), ensure a CAA-approved OSC and induct them into the trial, this would likely require an extension from 6 months to 12 months. However, a trial involving multiple operators would provide valuable data on interoperability, therefore we will pursue this, and apply for an extension if success is likely but there is a risk of the period expiring before another operator can be fully engaged.

2.5.5 The second phase of this trial ACP is likely to require an extension to 12 months.

2.6 Trial success criteria

As noted above in section 2.5, this trial is part of the CAA's CAP2616 BVLOS Sandbox. Also as above, the draft trial plan will continue to be developed with the CAA. However, we are clear that our success criteria will link to five of their nine key policy areas. In all cases there will be success; if the outcome is as expected then this validates the trial, if the outcome is otherwise then we will learn why and pass all the information to the CAA's Sandbox team, informing the overall development of UK BVLOS integration policies.

CAP2616 Sandbox Policy Area

2.6.1 Electronic Conspicuity (EC)

We will gather data and draw conclusions on the efficacy of the trial's EC requirements and how they work in practice.

Success will either be the validation of the trial's model, or the identification and recommendation of an amendment/alternate to pass to the CAA.

2.6.2 Detect And Avoid (Cooperative and Non-Cooperative)

Flylogix will lead on data gathering in the incremental steps of DAA, to analyse and validate the "Detect" function, the "Alert" function, and the "Avoid" function.

Success will either be the validation of the system (bearing in mind any current technological limits), or the identification and recommendation of an amendment/ alternate to improve overall performance.

2.6.3 Unmanned Traffic Management

We will gather data and draw conclusions on how Flight Intent Notifications are managed, strategic deconflictions identified and actioned, approvals or modifications promulgated, along with flight plan activation.

Success will either be the validation of the trial's E-ITM model, or the identification and recommendation of an amendment/alternate to pass to the CAA.

2.6.4 Airspace requirements for integration of BVLOS unmanned aircraft

We will gather data and draw conclusions on the airspace use, including how our TRA rulesets apply, regarding integration of BVLOS UA in Class G. This will include acquiring and theming feedback from other airspace users and ANSPs.

Success will either be the validation of the efficacy of the trial's airspace requirements, or the identification and recommendation of an amendment/alternate to pass to the CAA.

2.6.5 Service Provision needs and requirements for UAS in TMZ

We will gather data and draw conclusions on the ATS provision in the trial environment, for both the UA and relevant traffic receiving an ATS from Aberdeen. This would include the study of non-nominal occurrences should any occur in the trial.

Success will either be the validation of the trial's ATS provision as-is, or the identification and recommendation of an amendment/alternate to pass to the CAA.

2.7 Planned timeline

2.7.1 We plan the trial to start Tuesday 22nd April 2025 to maximise the opportunities for good flying weather. As part of our engagement we stated that the target starting timeframe could be between March and June 2025.

2.7.2 We intend to fly for a 6 month period, with the option to extend for a further 6 months, subject to due process.

2.7.3 If the trial concludes 6 months after launch, it will end on Tuesday 21st October 2025.

2.7.4 If the trial is extended by 6 months, it would end Tuesday 21st April 2026.

2.8 Assumptions and constraints

2.8.1 The main assumption for this trial is that the TRA should have a simple ruleset (see section 4.5 on p.17) and that electronic conspicuity (EC) is its main pillar, to minimise impacts on other airspace users.

2.8.2 The ruleset should not be a barrier for entry to the greatest number of airspace users, i.e. any EC aircraft operating in accordance with the ruleset will be a cooperative aircraft and can operate freely.

2.8.3 Aberdeen ATC would expect to operate in a business-as-usual manner in Class G over the North Sea during the trial, and the vast majority of flights in this area are professional operators serving the offshore energy industry (as per section 3 on p.11).

2.8.4 Aberdeen ATC will be the TRA controlling authority, and only non-cooperative (i.e. non-EC) crewed aircraft would require approval to enter – this is not expected to be common. There may be a delay to entry while such a request is processed. An outright refusal is not expected, and would be a last resort.

2.8.5 Should there be an emergency in the region, or should a relevant national security situation emerge in the region, the trial will be suspended and appropriate contingency procedures implemented.

2.8.6 Other assumptions include minimal impacts on both airspace and non-airspace users, as described later in this document.

3. The Current-Day Scenario, Airspace and Operations

3.1.1 The current airspace operation is the region over the North Sea east of Aberdeen and Sumburgh, out to the Median Line which separates the UK's mineral rights from those of neighbouring states.

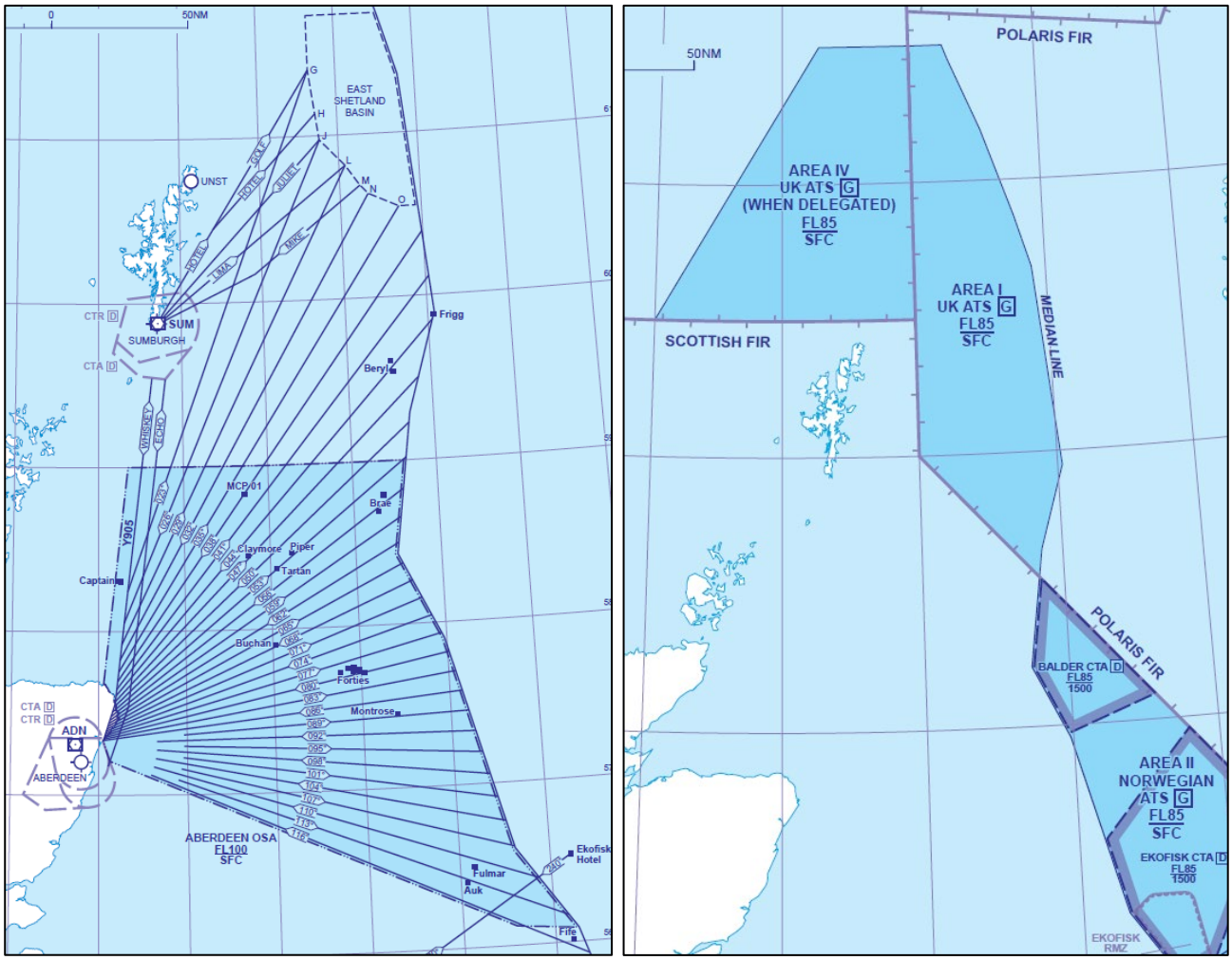

Figure 1 CAA Airspace chart extracts ((©) UK AIP ENR 6-26 and 6-44) showing (left) the current Helicopter Main Route Indicators (HMRIs), the Aberdeen OSA, airport CAS, some offshore installations, (right) the FIR boundary and the Median Line

3.1.2 It is primarily professional helicopter operations under Instrument Flight Rules (IFR) supporting the offshore energy industry, with Aberdeen Radar providing services outside controlled airspace (i.e. within Class G airspace). Aberdeen ATC typically provides a Deconfliction Service[3] in the two radar sectors closest to land (HELS & SUMBURGH), and a Traffic Service[3] in the radar sectors further east (BRENT & REBROS) – see Figure 2 on p.12.

3.1.3 In 2023 Aberdeen Radar provided these services to c.45,000 such flights, almost all of which were return trips (i.e. approximately 22,500 in each direction). Most (c.43,000 total/ 21,500 round trips) were within the central North Sea, in the Aberdeen Offshore Safety Area (OSA) up to the 59° North line of latitude, covered by HELS and REBROS sectors (see Figure 2 on p.12).

[3] The services provided by Aberdeen ATC are versions of the standard services described in the CAA document CAP774, slightly modified to suit the North Sea environment, provided with agreement of the helicopter operators. For the purposes of this ACP they are assumed to be equivalent to those in CAP774.

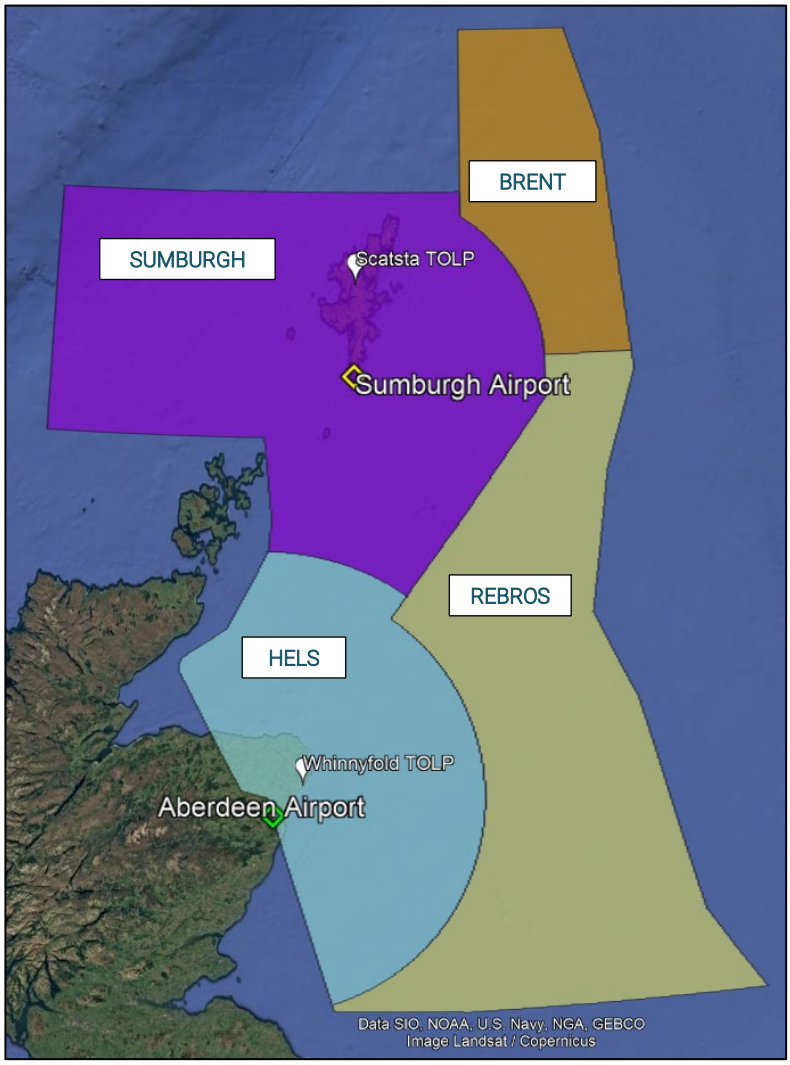

Figure 2 Google Earth (map ©) extract showing Aberdeen's four offshore radar sectors and the trial Take-off/ Landing Points (TOLPs)

3.1.4 The remaining c.2,000 movements (1,000 return trips) went further north into SUMBURGH sector, and also served installations in BRENT sector (including the East Shetland Basin shown in Figure 1). Note that the Median Line does not follow the Scottish Flight Information Region (FIR) boundary, and Aberdeen ATC provides a service to helicopters in an area of Norwegian airspace where the ATS has been delegated to the UK.

3.1.5 Typically, the helicopter support flights run Monday to Friday, with mornings of Tuesday, Wednesday and Thursday the busiest periods. Those busy periods could see 75-100 return trips per day, with weekends less busy. Aberdeen ATC is, however, a 24-hour, 365-day operation and flights to and from offshore installations take place at any time.

3.1.6 Generally, and by convention, helicopters follow the Helicopter Main Routing Indicators (HMRIs) as illustrated in Figure 1. Outbound (eastbound), most fly at 3,000ft altitude, with the return (westbound) at 2,000ft. This is the case for about 2/3 of trips, with c.1/3 flying higher (but rarely higher than 8,000ft). Sometimes the weather conditions (such as icing) mean they must fly lower, c.1,000ft-1,500ft. Flights to/from the installations closest to Aberdeen (such as the Captain installation, between Aberdeen and Sumburgh) also often fly below 2,000ft. As returning flights get closer to Aberdeen they sometimes change to using Visual Flight Rules (VFR) and descend below 2,000ft for the final 30-40nm, depending on weather (such as cloud base, cloud ceiling and in-flight visibility).

3.1.7 Aberdeen and Sumburgh both have Control Zones (CTRs) and Control Areas (CTAs), however the TRA is designed to avoid all controlled airspace (CAS). These CTRs and CTAs are illustrated in Figure 1.

3.1.8 Other regular airspace users in the region include the Maritime and Coastguard Agency (MCA) via the Joint Rescue Coordination Centre (JRCC), the Ministry of Defence (MoD), and Sumburgh Airport, part of Highlands & Islands Airports Ltd (HIAL).

3.1.9 Note on safety: the air traffic management risks of the North Sea helicopter operation in uncontrolled (Class G) airspace is designed to be as low as reasonably possible, and Aberdeen ATC takes its responsibilities extremely seriously, as does NATS. This trial is designed to ensure that safety is not compromised while acquiring data and evidence on its performance.

Current-day environmental situation

3.1.10 Given that the trial region is offshore in the North Sea itself, there are minimal noise impacts and minimal environmental impacts – the exceptions are where helicopter flights cross the coast to/from Aberdeen airport, which would not change under this trial.

3.1.11 The TRA TOLPs cross the coast at both Whinnyfold and Scatsta. Flylogix has operated its lightweight UAs regularly out of both TOLPs for more than two years, via TDA. Changing the UA's flight status to/from the same TOLPs via TRA instead of a TDA would not cause a change to these impacts.

3.1.12 However, under the current airspace change process (CAP1616 Edition 5) there is a requirement to determine the impacts on certain designated areas, known as European sites. Following engagement with NatureScot[4], the lead public body with appropriate expertise in advising on natural heritage matters in Scotland, they informed us that the Special Protection Area (SPA) known as "Buchan Ness to Collieston" (approximately 9km either side of Whinnyfold) is the only relevant European site, with impacts on seabird colonies to be considered.

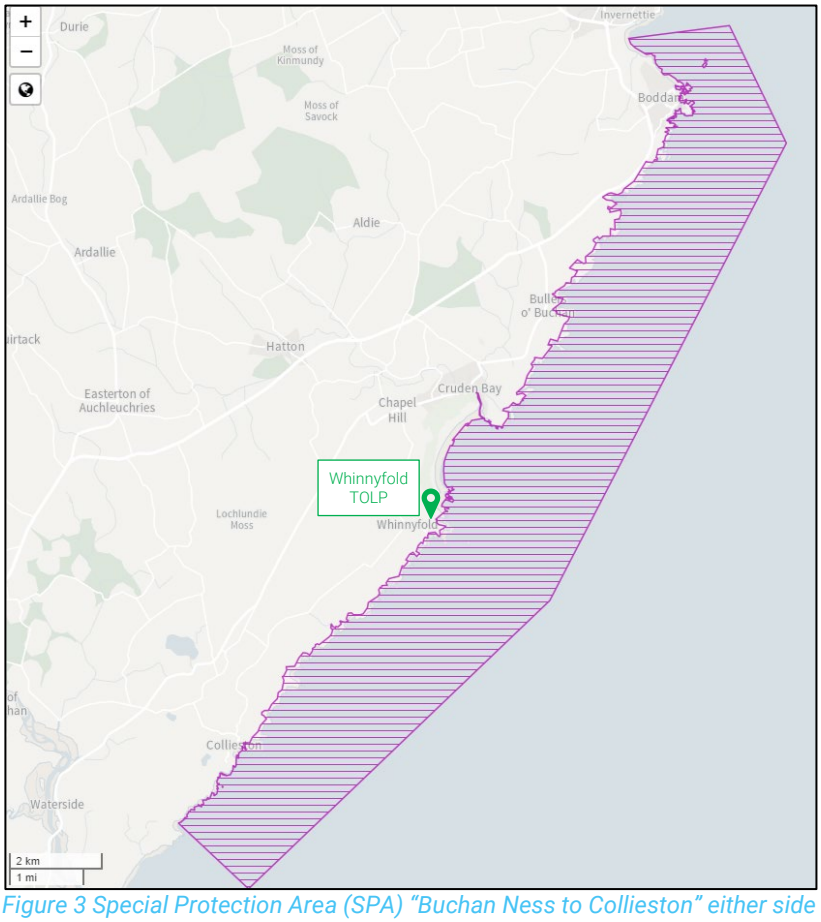

Figure 3 Special Protection Area (SPA) "Buchan Ness to Collieston" either side of Whinnyfold TOLP, identified by NatureScot (map ©) as having seabird colonies to be considered in this ACP

[4] See Section 5 on p.18.

3.1.13 We provided information on both TOLPs in our engagement material (see separately-published Annex B for more details).

3.1.14 The Whinnyfold TOLP is a field north of Whinnyfold village and south of Cruden Bay (corrected link to Google Map location). Unfortunately during our engagement, we incorrectly marked the adjacent field as the TOLP (the red X below) and the hyperlink included in the engagement material linked to the orange X. We apologise for the mistake but are confident it has no material impact on the ACP nor the SPA described above. The pilot would fly the UA VLOS from take-off to 400ft or higher, and would climb over the coast remaining VLOS. The UA would then be flown into the TRA, transitioning to BVLOS for its offshore task. Upon its return, the UA is transitioned from BVLOS back to VLOS for the landing. See Section 5 on p.19 for a summary of NatureScot feedback regarding Whinnyfold, and the separately-published Annex D Engagement Feedback Report.

Figure 4 Google Earth (map ©) extract, Whinnyfold TOLP detail (the correct field is adjacent to the north, and the same 300m scale is used)

3.1.15 The Scatsta TOLP is part of the disused Scatsta airport (link to Google Map location).

Figure 5 Google Earth (map ©) extract, Scatsta TOLP detail (with 1km scale)

3.1.16 There are no known relevant noise, planning or environmental issues to be addressed during this trial.

4. Description of the Temporary/Trial Airspace Design Option and Operation

4.1 The TRA design

4.1.1 The TRA design, as an airspace structure, remains the same as the engagement material. It is summarised below. Figure 6 shows the offshore installations planned for methane sampling by the Flylogix UA.

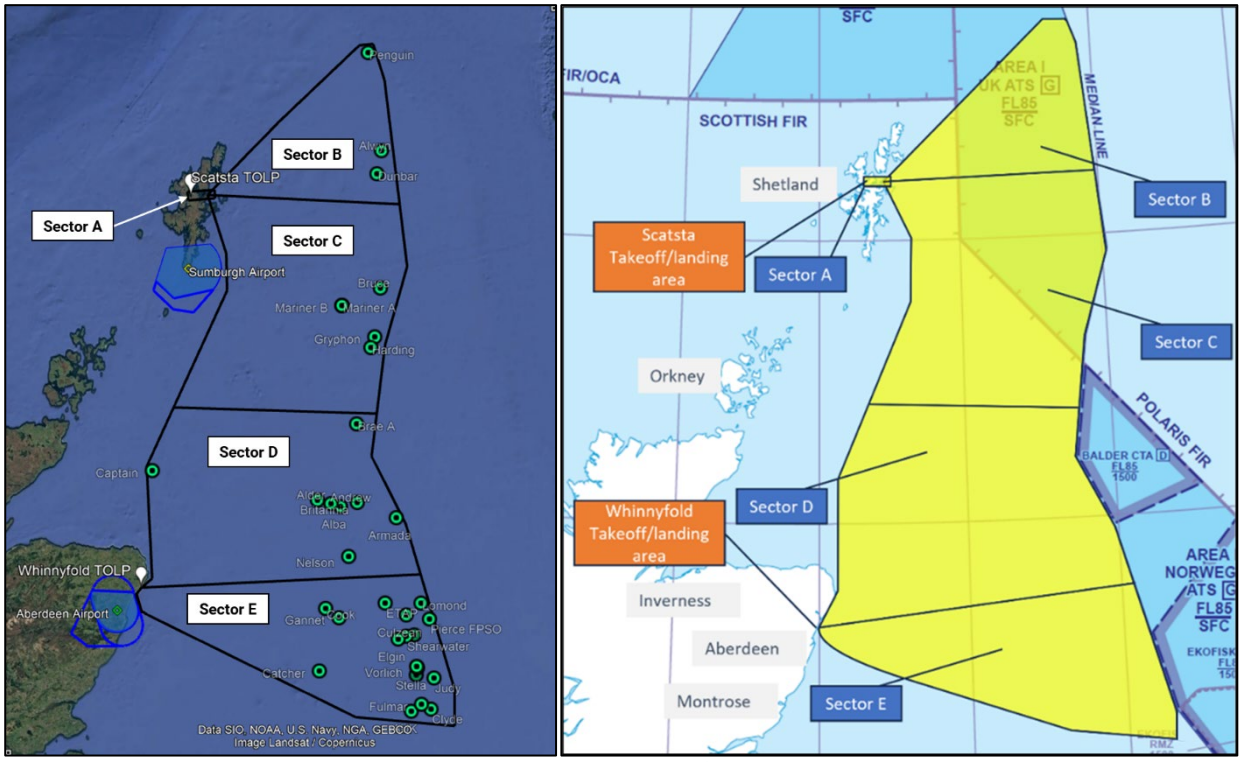

Figure 6 The proposed TRA, sectorised, from 100ft-1,500ft altitude (map extracts Google Earth © and AIP CAA ©)

4.1.2 In northern North Sea operations, Sector A will be activated for enabling connection to Sector B and Sector C. Based on the survey task, Sector B or Sector C or both will be activated. The UA would get airborne VLOS at Scatsta and fly east at c.800ft BVLOS, over the peninsulas and islands until established offshore, en route to its survey task in the northern North Sea. The return to land would be the equivalent reciprocal track.

4.1.3 In the central North Sea, Sector D or Sector E (or both) will be activated based on the survey task. The UA would get airborne VLOS at Whinnyfold and fly east into the TRA at c.800ft BVLOS, establishing offshore en route to its survey task in the central North Sea. The return to land would be the equivalent reciprocal track.

4.1.4 Our intent is to activate one main sector (B, C, D or E) during the initial trial stages developing to multiple sector activations and deactivations depending on the trial progression. Sector A would be activated only if B and/or C are required.

4.1.5 See Appendix 15 on p.29 for a full list of coordinates of each Sector. An Aeronautical data workbook containing technical details of each Sector vertex is supplied to the CAA as Annex J. The data is not confidential, however the CAA's public portal does not allow Excel files to be uploaded for publication, therefore it is absent from the portal.

4.1.6 Our sectorisation approach is designed to minimise the potential impact on other airspace users while facilitating the use of unsegregated trial airspace and to support the use-case task.

4.1.7 For the avoidance of doubt from a traffic data point of view, this trial would not cause changes in either the numbers, types or the typical flows of traffic in the region.

4.1.8 The lateral design of our TRA has been carefully considered to address operational requirements, safety, and integration with existing airspace users. The TRA is located outside of the Aberdeen and Sumburgh CTRs, reducing potential interference with controlled airspace operations. The inclusion of offshore installations, such as the Captain Rig on the west side, ensures that critical energy assets are encompassed for methane sampling missions. On the east side, the selected offshore installations also provide a robust justification for the geographical extent, ensuring comprehensive coverage of operational areas.

4.1.9 The size and shape of the sectors afford the UA freedom of movement to comply with its obligations under the rules of the air.

4.1.10 We are clear that the operation of the Flylogix UAS performs a valuable task in the offshore energy industry, and that this TRA is designed to support, explore and provide evidence on how those task-oriented operations can be integrated.

4.1.11 The sectors within the TRA are intentionally designed to be wide to accommodate the operational needs of UA while allowing them to integrate safely with crewed traffic. Furthermore, the regularity of the TRA's shape was a deliberate consideration to aid navigation, since irregular shapes can pose challenges and distractions to pilots, particularly in areas where maintaining visual awareness is critical, such as the North Sea.

4.1.12 By balancing operational needs with the requirement for seamless integration and navigation efficiency, the TRA design ensures safety, operational effectiveness, and the ability to gather critical data to advance uncrewed BVLOS operations toward normalisation.

4.1.13 The upper level of the TRA (1,500ft AMSL) is below the routine transit altitude of the oil & gas aviation support aircraft (see also paragraph 3.1.6 on p.12). It provides a minimum 500ft buffer between the routine transit altitude (800ft AMSL) of the UA and crewed aircraft transiting above the TRA, while allowing 200ft for the UA's upper operational variability (800+200+500=1,500ft).

4.1.14 The 100ft base of the TRA allows for ship-launched helicopters that cannot comply with TRA EC requirements (e.g. Royal Navy) to lift below the TRA in order to gain radio contact with Aberdeen ATC to obtain the necessary entry permission into the TRA.

4.1.15 We received feedback from the MoD regarding sectorisation which is discussed in the engagement Section 5 on p.19.

4.2 General operational considerations

4.2.1 Structure interactions: The TRA would not interact with other airspace structures in the region – the operation of the HMRIs illustrated in Figure 1 would not change, as they are not airspace structures *per se*.

4.2.2 Hours of operation and seasonal variance: The UA would operate within the TRA with reference to each operator's vehicle limitations, which typically include daylight hours and fair weather, mainly spring, summer and autumn. The specifics of Flylogix's vehicle limitations are illustrated in Section 14 on p28, and their OSC covers that in more detail.

4.2.3 Frequency of operation: On average we aim to fly four flights per week, per site – though some weeks may be more, some weeks fewer.

4.3 Local operational agreements to be in place for the trial

4.3.1 A Letter of Agreement (LoA) between NATS Aberdeen ATC and Flylogix, detailing the expected procedures to follow for pre-notification of flight, and expected airborne behaviours, and how relevant information should be passed between ATC and the remote pilot. A mature draft of this LoA is supplied to the CAA confidentially, as Annex G. If any additional operator(s) join the trial, a similar LoA will be produced via the usual process.

4.3.2 A Temporary Operating Instruction (TOI) for Aberdeen ATC, detailing how ATC will interact with the remote pilot/UAS. The trial will include an interface role. That role will support the UA operator and ANSP, and assist in UTM flight requests and management. A mature draft of this TOI is supplied to the CAA confidentially, as Annex H. The interface role's name is yet to be determined, and the details of this role are commercially confidential for this trial but will be supplied to the CAA for their assessment as part of Annex K.

4.3.3 Following further engagement and liaison there may be a requirement for an LoA to support military activity. We commit to working with the MoD to discuss this potential need, however this is not necessarily required, and no draft LoA material has been created at time of ACP submission.

4.4 Policy compliance

4.4.1 This proposal is part of the UK CAA's Sandbox CAP2616 regarding UAS integration, and is informed by the UK AMS (CAP1711) and the CAA's BVLOS policy concept document CAP2533 (previously discussed in paragraphs 2.1.3 and 2.1.4 on p.4).

4.4.2 See also section 9 on p.22.

4.5 The TRA operational ruleset, updated post-engagement

Updates post-engagement are mainly for clarity and avoidance of doubt; their intent is the same as the engagement material.

4.5.1 **Crewed Aircraft Electronic Conspicuity (EC) Requirements:**

Any crewed aircraft that intend to enter the TRA must be equipped with a serviceable transponder, actively radiating both ADS-B Out and active Mode-S. These are known as "cooperative flights" and may freely enter the TRA, which acts as a TMZ.

Aircraft unable to comply with this EC rule are known as "non-cooperative".

This is typical equipage for flights in this area, however not all military aircraft are equipped with ADS-B Out and some are not equipped with Mode-S.
This is discussed in the Engagement Section 5 on p.19.

4.5.2 **Crewed Aircraft Communications Requirements:**

It is highly recommended that crewed aircraft establish communications with Aberdeen ATC and avail themselves of the offshore radar services offered (discussed in paragraph 3.1.2 on p.11 and specified in the UK AIP ENR 1.6) – this is "business as usual" communications procedure for the region.

However, the TRA is not a Radio Mandatory Zone (RMZ). Crewed aircraft with EC but without communications established with Aberdeen ATC are still considered "cooperative" for the purposes of this ruleset.

4.5.3 **Uncrewed Aircraft EC Requirements (including our partner Flylogix):**

In addition to an Approved Operator Safety Case and Operational Approval, the UA must be equipped with a serviceable ADS-B In and radiating ADS-B Out and active Mode-S.

UA complying with these EC requirements are "cooperative", if unable they are "non-cooperative".

4.5.4 **Uncrewed Aircraft Communications Requirements (including our partner Flylogix):**

Satisfactory two-way communication must be established between the Remote Pilot and Aberdeen ATC. This may be via telephone or as agreed between Aberdeen ATC and the operator.

UA complying with the communications requirements are "cooperative", if unable they are "non-cooperative".

4.5.5 **Aircraft of any type that cannot comply with EC Requirements but can make contact with Aberdeen ATC:**

All non-cooperative aircraft that intend to enter or transit the TRA must contact Aberdeen ATC (the TRA's controlling authority) before entry, and non-cooperative aircraft must not enter the TRA without permission.

"Contact" may be via radio, phone call, or via pre-agreed method. The AIC and/or NOTAM will provide relevant contact details. There may be a separate method agreed for national security/MoD operations. If contact cannot be established, then non-cooperative aircraft must not enter the TRA.

4.6 General flight procedures

4.6.1 Flylogix or other UA operator will provide flight intent notification (FIN) through the NATS non-standard flight web portal (link).

4.6.2 Flylogix's UA will be flown under VLOS at Whinnyfold and at Scatsta, until the identification and position validation activity is completed. This will enable the UA to start their BVLOS operation under their OSC/OA.

4.6.3 Flylogix's UA (or any other UA) will typically maintain an altitude of 600-800ft AMSL in transit over the sea, and will perform their airborne task on site at an appropriate altitude before making an equivalent return trip.

4.6.4 Flylogix's UA (or any other UA) will be flown within the TRA adopting the "Rules of the Air" to avoid crewed traffic. Crewed aircraft flights within the TRA will have priority over uncrewed aircraft flights. If there is no advice from an ATS, then both crewed and uncrewed aircraft will be expected to conform to the rules of the air.

4.6.5 Aberdeen ATC will provide an ATS to crewed aircraft "business as usual".

4.6.6 Flylogix (or another participating UA operator) will utilise a surveillance feed to enhance situational awareness and support detection of all cooperative traffic.

4.7 Alternative options considered

4.7.1 Our original TRA design was the same overall size/shape but consisted of two sectors, one each for the northern and central North Sea.

4.7.2 Pre-engagement with the MoD identified that the two-sector design could present a greater impact on their operation, and there would be benefits to increasing the number of sectors. Therefore, a five-sector design was proposed in the engagement.

4.7.3 The five-sector design within this ACP is the same as that engaged upon.

5. Summary of Engagement

5.1 Engagement documentation published separately

5.1.1 We wrote a draft engagement strategy, submitted it to the CAA for review, and received some useful feedback. We finalised the strategy and then executed it. The strategy contained a summary of engagement activities already undertaken (early engagement), our audience (types, and a stakeholder list with justifications), our engagement approach, the materials, its length and what we would do with the results. The engagement strategy document is published separately as Annex A.

5.1.2 We wrote an engagement document, summarising the trial, its impacts, and asking for feedback. This was sent to our stakeholders on 8th October with a request for response by 5th November, a four week period. The engagement document is published separately as Annex B. During the engagement period we held webinars, and provided a presentation to attendees, this is published separately as Annex C.

5.1.3 After engagement ended, we wrote an engagement feedback report including the dates of webinars held, details of relevant feedback received, and our responses to that feedback. The engagement feedback document is published separately as Annex D.

5.2 Engagement feedback summary (see Annex D)

5.2.1 Most of the feedback resulted in support, no comment or no objection.

5.2.2 We received questions and clarifications on aspects of the trial, and we provided answers that did not require modifications.

5.2.3 We received requests to modify the trial, to which we responded, and we took some actions.

5.3 Actions taken

5.3.1 Avinor has provided a letter permitting the UK NOTAM office to issue NOTAMs in the area of Norwegian airspace where ATS is delegated to the UK (known as “Area I”).
This satisfies the CAA’s request for such a permission, and applies generally as well as to this trial ACP.

5.3.2 An appropriate phone number to Aberdeen ATC will be included on the NOTAM.
This is in response to a verbal request from Joint Rescue Coordination Centre (JRCC) in meetings with them, although they did not provide a formal response to the engagement.

5.3.3 We have updated the ruleset wording, for clarification and avoidance of doubt, as a result of MoD feedback. There is potential for the MoD to require a tactical local agreement regarding Navy carrier operations, this may be via LoA with Aberdeen ATC.
We commit to working with the MoD to discuss this potential need.

5.3.4 NatureScot advised that the Whinnyfold TOLP must be at least 100m from the cliff edge, this is already the case and will continue. NatureScot also advised that cliff overflights should not take place within one hour of dawn or dusk. This is also already the case and will continue under this trial.

5.3.5 We have clarified to NatureScot that the height of the UA over the cliffs (bird colony habitat) will be well above their advised height of 100m, and also clarified the correct Whinnyfold TOLP and the indicative path across the coast once the UA has reached or exceeded 400ft.

5.3.6 We have offered to accommodate an ornithologist supplied by NatureScot if they wish to assign one, however we contend this is not necessary, due to a recent news article published by another RPAS operator (link) describing the lack of drone disturbance on Scottish seabird colonies, under similar circumstances.

5.3.7 The vertical and lateral dimensions of the TRA did not change as a result of the feedback, and the planned sectorisation into five parts remains, as per the engagement material.

6. Assessment of Anticipated Impacts

6.1 General statement

6.1.1 We anticipate there would be minimal impacts on:

- The flow of instrument flight rules flights, including general air traffic and operational air traffic.
- The impact on visual flight rules operations.
- The impact on existing procedures and airspace/airport capacity.
- The impact on aerodromes and other aviation activities within or adjacent to the area of the proposed changes.
- Any flight planning or navigation requirements.
- The provision of air traffic services in the region.
- Complexity and workload of operations.
- Access requirements of other airspace users.
- The trial is not anticipated to cause changes in traffic levels nor fleet mix in the region.

6.2 Update on engaged-upon impacts on airspace users

6.2.1 The impact assessments from the engagement material have been updated below, following feedback. See the separately-published Annex D Engagement Feedback Report for more details.

6.3 Typical North Sea air traffic: minimal impacts

6.3.1 The trial is designed to have minimal impact on other air traffic operating in the North Sea. Flights above 1,500ft AMSL would be outside the planned TRA.
Flights below 1,500ft AMSL would be automatically permitted to enter the TRA provided they comply with the clarified ruleset in section 4.5 on p.17; no specific entry permission is required from Aberdeen ATC for cooperative flights.

6.3.2 Engagement feedback from the responding North Sea offshore helicopter operators confirmed there would be minimal impact. Some organisations asked clarifying questions.

6.4 Military/maritime impacts: minimal impacts

6.4.1 The trial is designed to have minimal impacts on MoD operations, however this does not mean there would be no impacts.

6.4.2 The trial objective, under CAP2533, is to integrate BVLOS uncrewed aircraft with crewed aircraft within unsegregated airspace. EC is the fundamental component to enable the BVLOS operator to detect crewed traffic and remain well clear. To support the trial objective, we propose that the BVLOS uncrewed aircraft will have priority over non-cooperative crewed aircraft when the non-cooperative aircraft is outside the TRA.

6.4.3 Should the MoD have non-cooperative flights that need to enter/transit an active TRA sector, permission must be requested in line with the ruleset. The MoD will establish a method of communications with Aberdeen ATC, the TRA controlling authority.

6.4.4 There may be a delay in issuing that permission, and there may be altitude or spatial restrictions, however we do not anticipate a denial/refusal.

6.4.5 Cooperative flights would not need permission from Aberdeen ATC to enter the TRA.

6.4.6 Should the MoD have a real-time defence operation in an area where the trial is planned or is flying, national security takes precedence and the trial would be suspended in that area.

6.4.7 We asked the MoD to inform us should there be significant conflicting military exercises including carrier deployments in advance, so that coordination and deconfliction activities could be undertaken.

6.4.8 Should the MoD, NATS Aberdeen ATC and Flylogix agree that there is potential to develop an LoA or similar operational agreement during the trial, then this would be welcomed.

6.4.9 This will be explored after ACP submission; should any appropriate procedures be required and developed, the CAA will be kept informed.

6.4.10 From a search and rescue (SAR)/coastguard point of view, we held meetings with the Joint Rescue Coordination Centre (JRCC). We did not get a formal response, however SAR operations would take priority over the trial, and we undertook to provide appropriate communications details in case of SAR.

6.5 General aviation (GA) impacts: minimal impacts

6.5.1 GA flights, for example private pilots flying small aircraft for sports and leisure, gliders, balloonists, microlights, hang/paragliders, and other similar airspace users, do not typically fly at significant distances offshore.

6.5.2 We canvassed GA organisations represented at the National Air Traffic Management Advisory Committee (NATMAC); those which responded were supportive or had no objection.

6.6 Nearby airfields, airports and ANSPs: minimal impacts

6.6.1 Aberdeen ATC would be the TRA controlling authority and are therefore part of this proposal.

6.6.2 We sent engagement requests to potentially affected airfields. Two responded (Buchan Aero Club at Peterhead Longside, and Hatton private airstrip), we provided clarifying responses to their questions.

6.6.3 HIAL operates Sumburgh airport and they confirmed no operational impacts.

6.6.4 Avinor is the adjacent ANSP for Norway. They have confirmed no impact and have provided a letter allowing NOTAMs to be issued in the area where ATS in Norwegian airspace have been delegated to the UK in “Area I”.

7. Timeline for implementation

7.1 Aeronautical Information Circular (AIC)

7.1.1 The 6-month planned project timeline is:

CAA decision expected	06/02/2025
Cutoff for AIC submission	20/02/2025
AIC finalised	14/03/2025
AIC publication	03/04/2025
Trial start date	22/04/2025
Trial end date	21/10/2025
(Potential extension	21/04/2026)

7.2 Staff training

7.2.1 The trial operational agreements, via TOI (see section 4.3 on p.17), would be briefed to Aberdeen ATC via standard briefing systems by late March 2025. There are no plans for Aberdeen ATC to hold formal training sessions.

7.2.2 Staff providing the interface role (summarised in paragraph 4.3.2 on p.17) will be identified and trained by late March 2025.

7.3 Letter of Agreement (LoA) and Temporary Operating Instruction (TOI)

7.3.1 The final draft LoA and TOI will be submitted to CAA at time of ACP submission, as commercially confidential Annex G LoA and Annex H TOI, and are not published.

7.3.2 Finalised signed documents (which may have minor updates or formatting revisions) will be submitted to CAA in line with standard practice pre-implementation timeline.

7.3.3 This is expected early/mid-February 2025 presuming this ACP is approved.

8. Supporting Infrastructure and Resilience

8.1 Radio communications

8.1.1 The TRA does not have specific requirements. The existing systems and coverage are sufficient for the trial.

8.2 Navigation

8.2.1 The TRA does not have specific requirements. The existing systems and coverage are sufficient for the trial.

8.3 Surveillance: EC coverage

8.3.1 The TRA creates TMZs and relies on an EC environment.

8.3.2 The separate Annex F Surveillance Evidence, which is commercially confidential and not published with this ACP, demonstrates sufficient surveillance coverage in support of the EC environment.

8.4 Surveillance: ATC display

8.4.1 Engineering work on the creation of appropriate Aberdeen ATC radar display map layers and associated support information is in progress, and will be ready by late March 2025.

8.5 Surveillance: Support feed to UA operator

8.5.1 Commercially confidential – to be redacted.

[redacted]

9. Regulations, Policies and Harmonisation

9.1 Policy compliance

9.1.1 As previously stated in section 4.4 on p.17, this proposal is part of the UK CAA's Sandbox CAP2616 regarding UAS integration, and is informed by the UK AMS (CAP1711) and the CAA's BVLOS policy concept document CAP2533.

9.1.2 CAA Policy 133 (Policy for the establishment and operation of special use airspace, typically known as the "SUA policy") has been considered for this proposed TRA. The SUA policy's safety buffer requirements have also been considered, however this TRA lies entirely outside controlled airspace, therefore that element of the policy does not apply.

9.1.3 Appropriate negotiations have been held or are in progress with CAA representatives regarding the detailed trial plan and associated ancillary materials. The draft Project Assurance Plan has been submitted to the CAA as Annex K, it is commercially confidential and will not be published.

10. Safety assessment

10.1 Aberdeen ATC

10.1.1 We have worked in partnership with Aberdeen ATC and UA operator Flylogix to ensure appropriate safety related activities have been completed.

10.1.2 This includes HazID activity and ATC Procedures Safety Assessment (APSA) activity, using NATS' safety management processes.

10.1.3 These activities have resulted in a mature draft TOI for Aberdeen ATC to operate the trial, with a mature draft LoA between Aberdeen ATC and the UA operator.

10.1.4 The final draft LoA and TOI have both been supplied to the CAA as part of this ACP, as commercially confidential Annex G LoA and Annex H TOI, and are not published.

10.1.5 See also section 7.3 on p.21.

10.2 Initial UA Operator

10.2.1 Flylogix has worked with the CAA RPAS team on their Operational Safety Case (OSC), and an Operational Authorisation (OA) application is in progress at time of ACP submission.

10.2.2 Approval will be in place before Flylogix flying commences.

10.3 Additional UA operator

10.3.1 As noted in paragraph 2.2.3 on p.4, other operators may be accommodated subject to OSC, acquisition of OA and via LoA.

10.3.2 When another operator is identified, equivalent safety activities will be developed and carried out in line with the above.

11. Environmental

11.1 Summary

11.1.1 For more details see separately-published **Annex E Environmental Impacts** document.

11.2 Noise Assessment: minimal impact

11.2.1 The UA would fly mainly offshore, with flight over land over very sparsely populated rural areas. The available noise metrics of this UA would be ≤45dB L_{ASmax} at 400ft AGL at a distance of 1km – this is a low-noise UA.

11.2.2 Noise footprints are not available for the vehicle, however its typical operational noise impacts are significantly below the 65dB L_{ASmax} metric, leading to minimal overall impacts.

11.2.3 As the UA will transit at 800ft AMSL this already-low noise impact would diminish further.

Scatsta TOLP

Figure 7 Google Earth (map ©) extract, Scatsta take-off/landing point (TOLP) detail

11.2.4 From Scatsta the flight would get airborne, climb to 400ft VLOS and higher (600-800ft) BVLOS joining the overhead TRA, then head east over sparsely populated land until crossing the coast/peninsulas/islands and finally offshore. It would return following the same or a similar path.

11.2.5 The arrows shown above are indicative illustrations; the specific path flown may vary, but will be consistent with the general direction.

Whinnyfold TOLP

Figure 8 Google Earth (map ©) extract, Whinnyfold take-off/landing point (TOLP) detail

11.2.6 From Whinnyfold the flight would get airborne VLOS and climb to 400ft or higher in the vicinity of the field before crossing the coast to join the TRA BVLOS and its offshore task.

11.2.7 The green arrow indicates an approximate path towards the offshore TRA once it has already reached/exceeded 400ft VLOS, however the specific path may differ – the arrow provides scale and an illustration, rather than a precise path to always be followed. It would return following the same or a similar path.

11.2.8 Note: during our engagement we incorrectly marked the adjacent field to the south as the TOLP (the red X in Figure 8 above) and the hyperlink in the document linked to the orange X, c.150-200m away. We apologise for the mistake, and have updated NatureScot and Hatton Airstrip via email and within the separately-published Annex D Engagement Feedback Report.

11.2.9 We are confident this has no material impact on the ACP noise impacts, because the UA would still cross the coast at c.400ft or above VLOS and head to the offshore TRA, staying away from noise sensitive areas.

11.3 Habitats Regulations Assessment summary

11.3.1 The HRA screening is detailed in the separately-published Annex E Environmental Impacts document.

11.3.2 In summary, secondary screening may be required because we are unable to answer 'no' to the early screening questions.

11.3.3 Engagement with NatureScot regarding the Scatsta take-off/ landing point resulted in no comments about nearby European sites.

11.3.4 Engagement with NatureScot regarding the Whinnyfold take-off/ landing point resulted in mitigation suggestions to reduce disturbance to the breeding seabird colonies of the Buchan Ness to Collieston SPA, the only CAP1616-specified European site of relevance.

11.3.5 These mitigations are detailed in the separately-published Annex D Engagement Feedback Report and are summarised in Section 5.3 on p.19. We have responded to those suggestions and state that sufficient mitigation exists based on our responses.

11.3.6 We contend that noise and biodiversity impacts would be minimal/negligible. The designed-in lack of impact on other aircraft in the region means the only impacts would be that of the aircraft itself, which would be minimal/negligible.

12. List of Documents

The following table lists the contents of the ACP package submitted to the CAA. Most (but not all) documents are published on the CAA's airspace change portal (link). The table indicates which are, and which are not.

Document	Title	Publication status	Pages
ACP	Airspace Change Proposal (this document)	Public portal (some redaction, unredacted version for CAA only)	34
Annex A	Engagement Strategy	Public portal	8
Annex B	Engagement Document	Public portal	16
Annex C	Engagement Webinar Presentation	Public portal	7
Annex D	Engagement Feedback Report	Public portal (some redaction, unredacted version for CAA only)	26
Annex E	Environmental Impact Assessment/HRA	Public portal	8
Annex F	Surveillance Evidence	Commercially Confidential, CAA only, not for publication	N/A
Annex G	Final Mature Draft LoA	Commercially Confidential, CAA only, not for publication	N/A
Annex H	Final Mature Draft TOI including APSA	Commercially Confidential, CAA only, not for publication	N/A
Annex I	Detailed trial plan	Commercially Confidential, CAA only, not for publication	N/A
Annex J	Aeronautical data workbook	Not confidential but public portal cannot accept Excel file	N/A
Annex K	Mature Draft Project Assurance Plan	Commercially Confidential, CAA only, not for publication	N/A

Table 1 List of documents comprising the package for this trial ACP

13. Summary

13.1.1 The purpose of this trial ACP is to further the understanding of how uncrewed aircraft could be safely integrated with crewed aircraft in a shared airspace environment. This is part of the "accommodation" stage of UA integration.

13.1.2 The planned activities have considered safety at each step, while being designed to minimise impacts on both airspace users and the environment.

13.1.3 Our plans include two phases. The first would establish the foundation for operating a single UA. The second would expand by either adding a second UA from our partner operator, or by adding additional operators, or both if possible.

13.1.4 Should we be unable establish the second phase within the 6 month trial period, we plan to request an extension of a further 6 months.

13.1.5 The output of the trial will support the further development of accommodating UAS in unsegregated airspace, informing the overall development of UK BVLOS integration policies.

14. Appendix: Flylogix operational limitations

Information from the manufacturer regarding conditions for flight.

FX2 Series Operational Limitations	
Visibility	VFR Day ONLY – 5km visibility
Cloud Base	VFR – Clear of Cloud, Surface in Sight
Weather	Day VMC, No Lightening Forecast or observe in the TDA, No Snow
Temperature	Above 0 degrees C and blow 40 degrees C. Below the freezing layer (Fmet105)
Windspeed ToL Site	Headwind <25kts Crosswind Limit 10kts Hard
Windspeed at Asset	Headwind <30kts
Rain/Snow	>1.5mm of rain per hour. No snow.

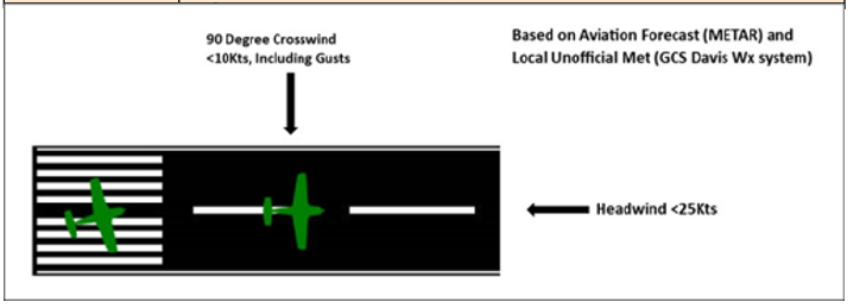

Figure 9 Flylogix operational limitations information (supplied by Flylogix ©, sic)

15. Appendix: TRA Sector Coordinates

This appendix provides the coordinates of each TRA vertex, clockwise from the northern point, with the first point repeated as the final point to ensure the polygon is closed. Each sector's vertical extents are 100ft-1,500ft AMSL and each sector is entirely Class G. In AIC charts each sector would be marked with semicircles on the interior, as is the convention:

The official name of each sector will be "North Sea TRA Sector [ABCDE]".
Overview of the TRA sectors, including take-off/landing point s (TOLP):

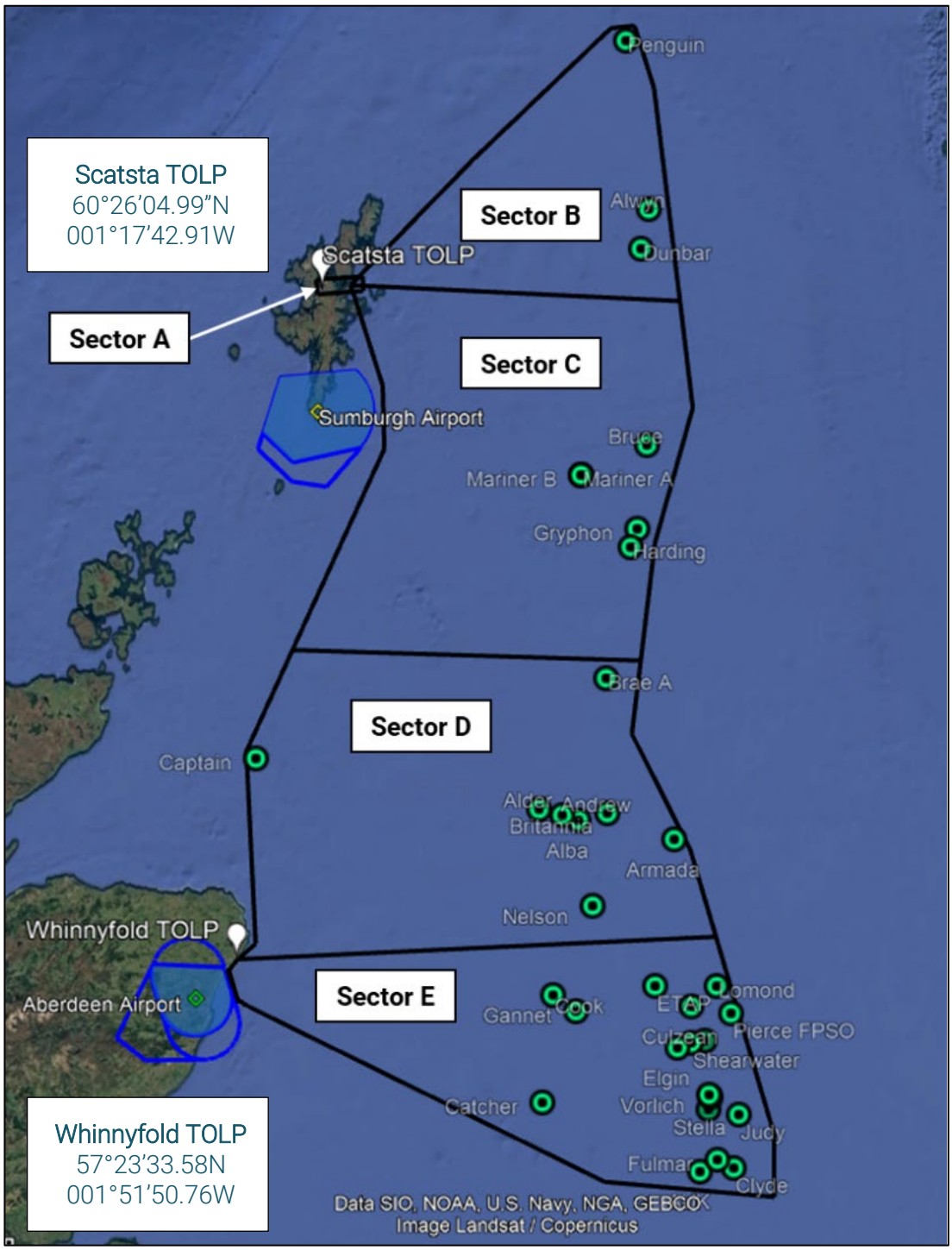

Figure 10 TRA sectors and TOLP coordinates shown on Google Earth (© map extract)

15.1 Sector A (connecting Scatsta to northern North Sea sectors B and C)

Point	Latitude DDMMSS.ssss	Longitude DDDMMSS.ssss
1	602938.4019N	0005532.9023W
2	602542.7801N	0005453.6674W
3	602429.9344N	0012009.1607W
4	602832.2329N	0012108.1559W
1	602938.4019N	0005532.9023W

Table 2 North Sea TRA Sector A details

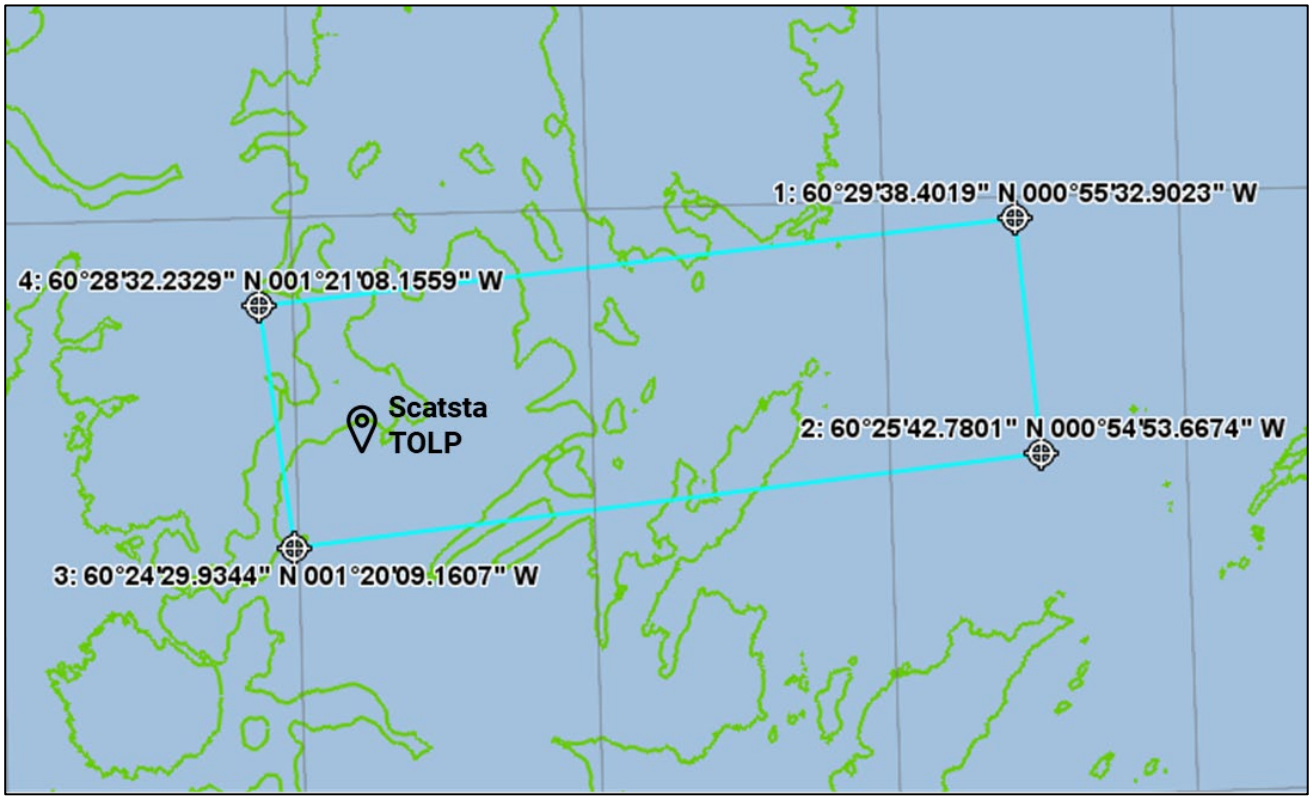

Figure 11 North Sea TRA Sector A points

15.2 Sector B (northern North Sea)

Point	Latitude DDMMSS.ssss	Longitude DDDMMSS.ssss
5	613836.7895N	0013652.8795E
6	612122.0000N	0014718.0000E
7	602254.3404N	0015857.0598E
8	602713.5268N	0010158.3870W
9	610203.1319N	0000458.9246E
10	613803.8471N	0012322.8816E
5	613836.7895N	0013652.8795E

Table 3 North Sea TRA Sector B details

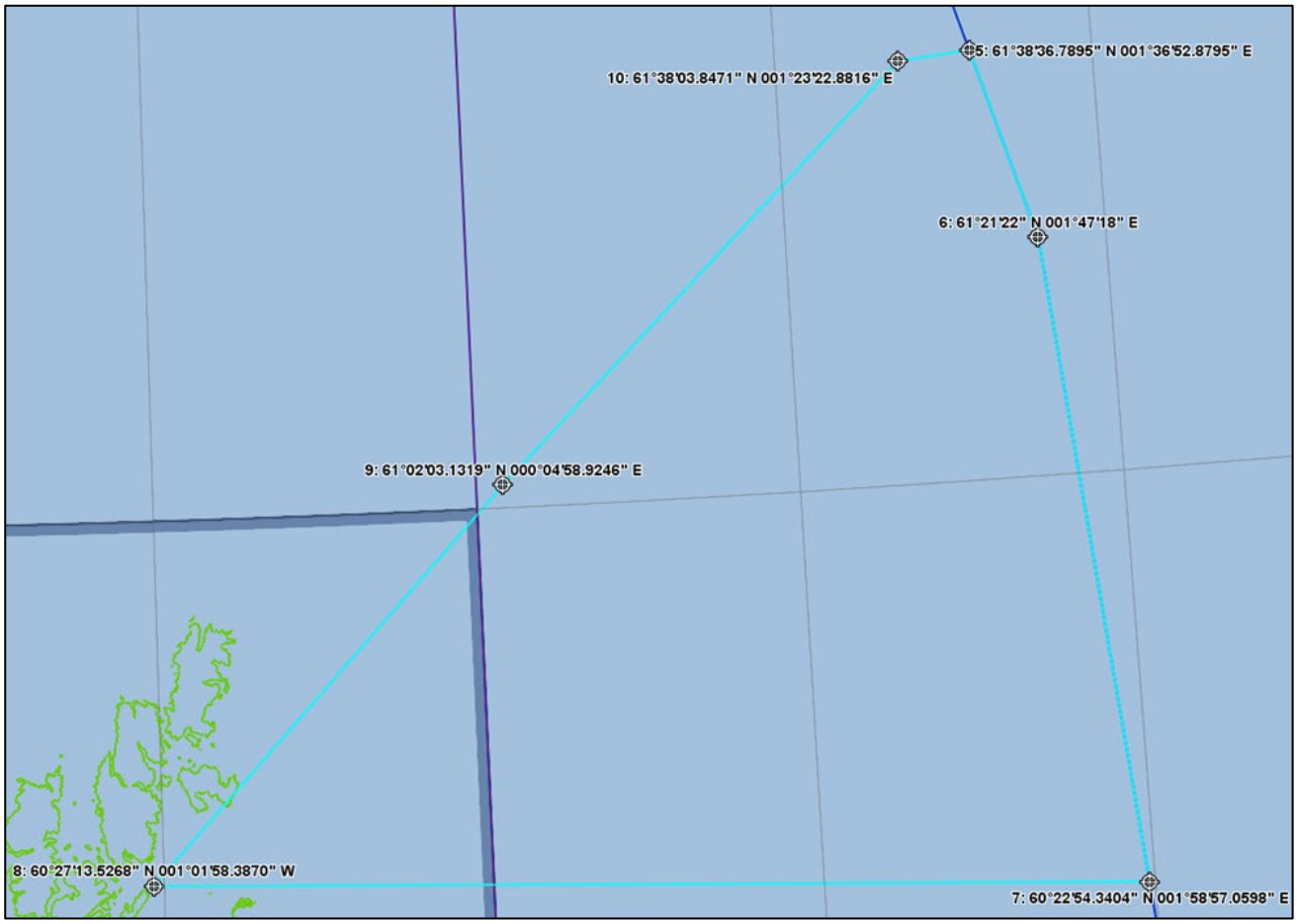

Figure 12 North Sea TRA Sector B points

15.3 Sector C (northern North Sea)

Point	Latitude DDMMSS.ssss	Longitude DDDMMSS.ssss
8	602713.5268N	0010158.3870W
7	602254.3404N	0015857.0598E
11	595346.0000N	0020430.0000E
12	591722.0000N	0014236.0000E
13	590504.0000N	0013916.0000E
14	584536.1504N	0013404.9808E
15	584750.6224N	0012754.4450W
16	594252.6378N	0004145.5053W
17	600002.5962N	0004317.6169W
8	602713.5268N	0010158.3870W

Table 4 North Sea TRA Sector C details

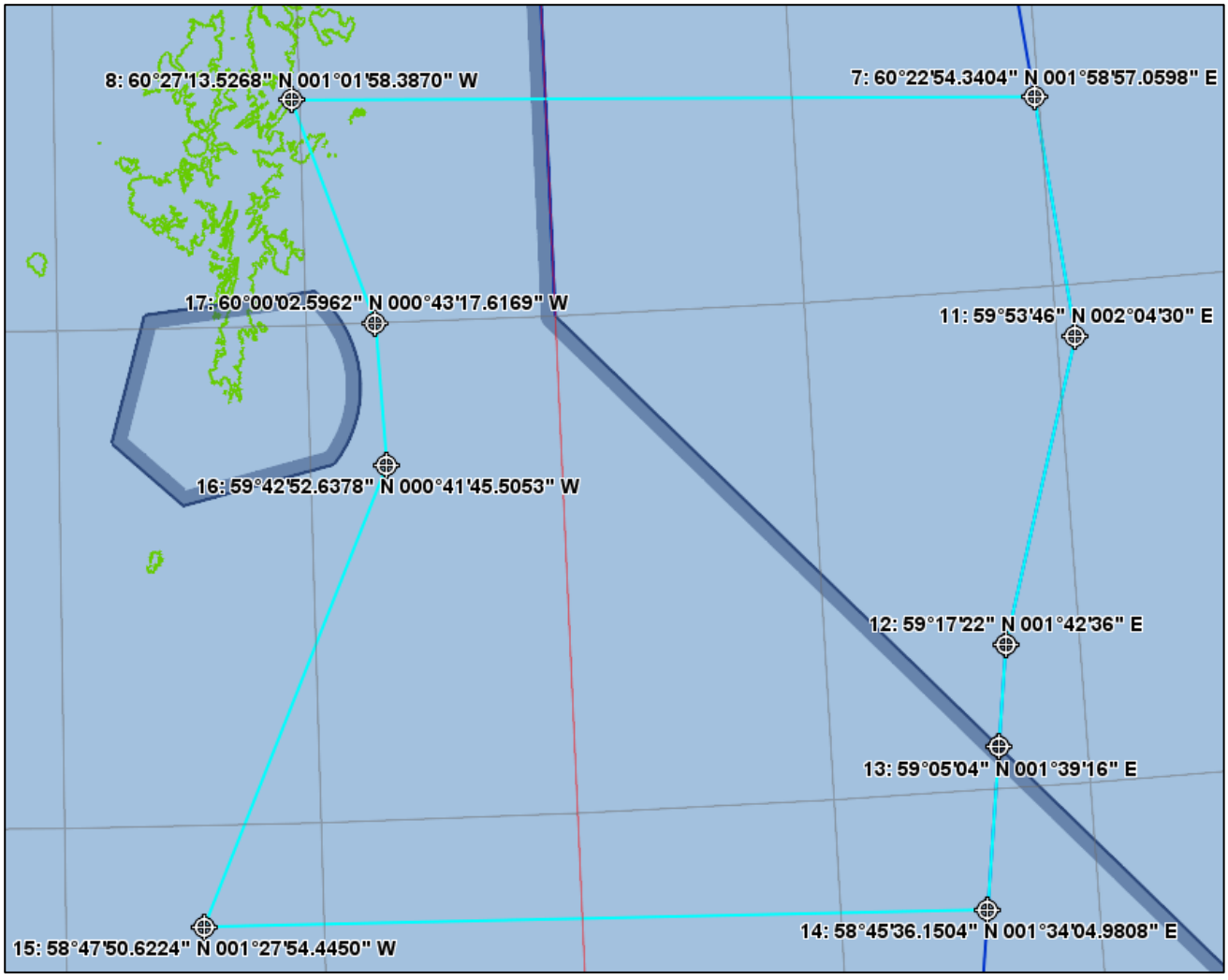

Figure 13 North Sea TRA Sector C points

15.4 Sector D (central North Sea)

Point	Latitude DDMMSS.ssss	Longitude DDDMMSS.ssss
15	584750.6224N	0012754.4450W
14	584536.1504N	0013404.9808E
18	582546.0000N	0012854.0000E
19	575416.0000N	0015748.0000E
20	573014.1824N	0020959.9818E
21	572320.3885N	0015121.3574W
22	572747.6083N	0014227.6462W
23	581957.5902N	0015017.2353W
15	584750.6224N	0012754.4450W

Table 5 North Sea TRA Sector D details

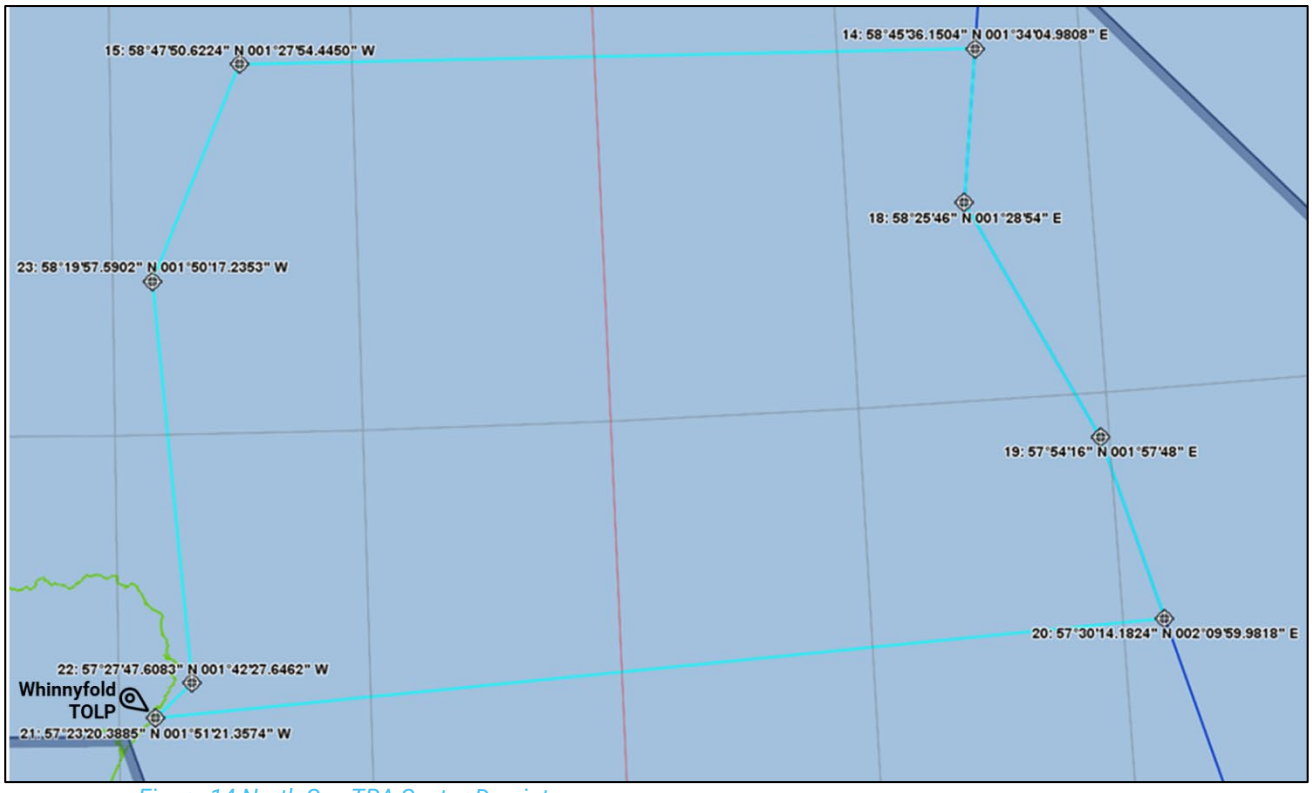

Figure 14 North Sea TRA Sector D points

15.5 Sector E (central North Sea)

Point	Latitude DDMMSS.ssss	Longitude DDDMMSS.ssss
20	573014.1824N	0020959.9818E
24	563540.0000N	0023642.0000E
25	561818.5050N	0023603.9553E
26	562339.4934N	0011241.8381E
27	571034.3007N	0014512.7774W
28	571302.4642N	0015308.4927W
29	571526.7670N	0015416.5840W
30	571919.5012N	0015644.3454W
21	572320.3885N	0015121.3574W
20	573014.1824N	0020959.9818E

Table 6 North Sea TRA Sector E details

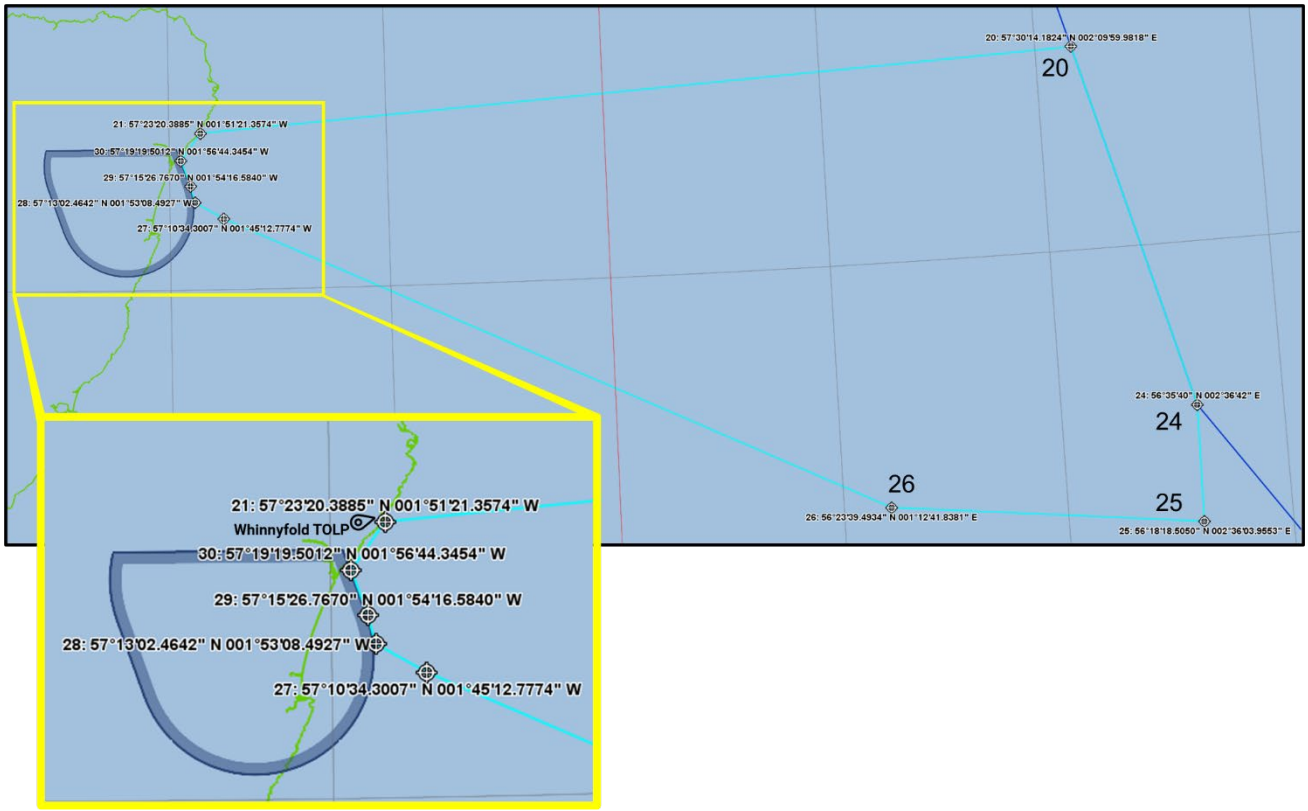

Figure 15 North Sea TRA Sector E points

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